



Hardy Fern Foundation Quarterly



Winter 2012

THE HARDY FERN FOUNDATION

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The Hardy Fern Foundation was founded in 1989 to establish a comprehensive collection of the world's hardy ferns for display, testing, evaluation, public education and introduction to the gardening and horticultural community. Many rare and unusual species, hybrids and varieties are being propagated from spores and tested in selected environments for their different degrees of hardiness and ornamental garden value.

The primary fern display and test garden is located at, and in conjunction with, The Rhododendron Species Botanical Garden at the Weyerhaeuser Corporate Headquarters, in Federal Way, Washington.

Satellite fern gardens are at the Birmingham Botanical Gardens, Birmingham, Alabama, California State University at Sacramento, California, Coastal Maine Botanical Garden, Boothbay, Maine, Dallas Arboretum, Dallas, Texas, Denver Botanic Gardens, Denver, Colorado, Georgeson Botanical Garden, University of Alaska, Fairbanks, Alaska, Harry P. Leu Garden, Orlando, Florida, Inniswood Metro Gardens, Columbus, Ohio, New York Botanical Garden, Bronx, New York, and Strybing Arboretum, San Francisco, California.

The fern display gardens are at Bainbridge Island Library, Bainbridge Island, WA, Bellevue Botanical Garden, Bellevue, WA, Lakewold, Tacoma, Washington, Lotusland, Santa Barbara, California, Les Jardins de Metis, Quebec, Canada, Rotary Gardens, Janesville, WI, and Whitehall Historic Home and Garden, Louisville, KY.

Hardy Fern Foundation members participate in a spore exchange, receive a quarterly newsletter and have first access to ferns as they are ready for distribution.

Cover design by Willanna Bradner

HARDY FERN FOUNDATION QUARTERLY

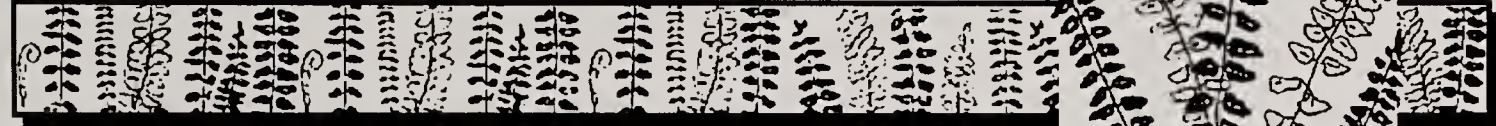
THE HARDY FERN FOUNDATION QUARTERLY

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President's Message

Welcome to 2012,

We are saddened by the recent passing, November 18, 2012 of Jocelyn Horder. A beloved founding board member, Jocelyn was immensely respected throughout the gardening community near and far. A congenial manner with a twinkle in her eye, made it easy to get to know her. Never dismissive, she was endearingly humble and always gave you the feeling she was deeply interested in what you were saying. We will miss her support and companionship; she was, and always shall be great.

Jocelyn has left us with a very generous endowment and much the richer with knowledge from benefits of her lifelong passion for plants. We hope to establish a garden in her memory at the Public Library in Poulsbo, Washington.

As we turn the calendar to the New Year, we are looking forward to some new and a few customary events.

The Hardy Fern Foundation was the recent recipient of a grant from The Elisabeth Miller Foundation to improve the irrigation of the Stumpery. John van den Meerendonk has taken on the task.

We again will provide an educational booth at the Northwest Flower and Garden Show in Seattle, Washington. We have another opportunity to contribute knowledge and advice to local gardeners concerning the use of ferns in their landscape.

The Bellevue Botanic Garden will dedicate a new Suspension Bridge on Mother's day in May. The Hardy Fern Foundation has been asked to provide ferns native to the northwest. The plantings would be around and under the bridge in the ravine. This will demonstrate how ferns can add to the richness and beauty of a high visibility structure.

The Hardy Fern Foundation held a Winter Slide Show and Luncheon Saturday, January 14th, 2012 at the Rhododendron Species Botanical Garden. Richie Steffen shared his brilliant photographic skills showing us some of his slides from the HFF/BPS Southeast tour this past summer. The presentation covered ferns and plants from six states with private garden visits included. Sue Olsen added a few of her own slides from the Atlanta Botanical Garden. With 20-some attendees, the limits of the facility were stretched, prompting thoughts toward a larger venue for the future. A sumptuous luncheon was prepared and served by April James to the enjoyment of all.

Happy New Year,

Pat Kennar

Andean flora of Ecuador – a fern perspective (Sept. 27 – Oct. 12, 2011)

Martin Rickard

Tenbury Wells, England

Your Editor, Sue Olsen, regularly tries to pressure me into writing accounts of various exploratory fern trips in exotic places. Usually they are joint trips with other fern enthusiasts and thus written up by others, or not, in my opinion, sufficiently interesting to merit a report. My recent venture into the Andes of Ecuador was an exception. It possibly ranks as the best fern paradise I have ever visited.

The trip was organised by Nature Trek under the heading of *Andean Flora of Ecuador*. We were lead by a very knowledgeable and likeable botanist/ornithologist, Gustavo Canas. The main thread of the trip was to sample some of the 3,700 species of orchid known to grow in Ecuador. Other plants of interest were noted on the way. We were only 4 on the trip, I was the only ferny. Gustavo knew most plants by at least their genus, but not the ferns! That did not worry me; I can appreciate beautiful and interesting ferns without having to know their names! Fortunately I did go on a recent fern trip to Costa Rica so some of the plants we saw were familiar, if only at generic level.

The trip started slowly seeing some sites in Quito including the fruit and vegetable market – amazing! They certainly have a lot of fruits – they certainly have a lot of traffic too – at least in the Quito region! Our first night was in the beautiful Hacienda Leito in very rural countryside at an altitude of 2540 metres in the hills north of Banos and east of Patate. From the dining room we overlooked the gently smoking, yet snow capped, volcano Tungurahua (5023m) in the far distance. (Since our return home it has erupted much more spectacularly. Nature Trek changed our itinerary to this Hacienda away from a hotel near Banos for safety reasons). The next morning we drove up a rural road (actually a track!) into a hilly area to the east of the hotel. There were lots of ferns in the hedges and on banks but the highlight for me, at just under 3000 m, was a splendid plant of *Dicksonia sellowiana* (photo pg. 13). Unlike plants I'd seen a few years earlier in Costa Rica this plant was just the right height to photograph and examine its sori and the hairs in the crown. Nearby was *Asplenium monanthes*, *Polypodium monosorum*, and as yet unidentified species of *Polystichum*, *Adiantum*, *Diplazium*, *Elaphoglossum*, *Grammitis* etc, etc. A little further along the road on our descent I saw my first *Lophosoria quadripinnata*, not much bigger than the plant in my garden back in central England! We soon stopped for lunch and strolling off with my sandwiches I was fascinated by the frequent tufts of various species of *Huperzia*. The rest of the day was spent in semi-urban areas on the outskirts of Banos – ferny, but nothing which really got me excited apart from trees abundantly festooned with bromeliads etc. and magnificent plants

of *Asplenium uniseriale* with metre long fronds all rooting at their tips.

The next day we botanised a very dry, rocky area in the river valley near Banos at about 2000 metres, plenty of rather splendid orchids and beautiful Passion flowers. Not surprisingly there were few ferns but I did see a xerophytically modified polypodium looking suspiciously like *Pleopeltis thyssanolepis* together with masses of *Cheilanthes bonariensis*. Passing the bungee jumping area of Banos (we did not have time for frivolous things like that) we took a long drive east into the fringes of Amazonia at Puyo. Here the attraction was a collection of native orchids. There were inevitably plenty of ferns, some unidentified filmies and a magnificent *Lophosoria quadripinnata*.

The next morning we quit the very pleasant Hacienda Leito and struggled with traffic for about two hours through a confusing patchwork of villages – even our local guides seemed to be lost! Our prize was worth it! We skirted the great Volcano Chimborazo reaching 4300 metres, pretty high! The main mountain with huge cliffs of glaziers loomed above, reaching a height of 6310 metres. Walking 100 yards, even on the flat, required frequent pauses for breath. No ferns at all here but the alpine flora was stunning despite the soil looking like dust dry sand. Late afternoon we headed back to Quito ready for our early departure by air to southern Ecuador early next morning.

The flight landed at Catamayo, much drier and at around 1300 metres a much lower altitude than Quito (2800 metres). From here we drove up a local hill towards Loja. It looked unpromisingly dry, but at the top the road reached 2640 metres and vegetation was much greener although I would not think it was cloud forest. This was a good stop with plenty of orchids and ferns. Everyone was happy, except it rained! A highlight here was a blechnum which looked very similar to, but not quite the same as, *Blechnum chilense*. It keyed out as *B. cordatum*. The frond ended abruptly with a terminal segment, and the basal pinnae were reduced to lobes. The lamina texture was even, unlike *B. chilense*. Later, nearby, we found a young blechnum which more closely resembled *B. chilense*. Seeing the degree of variation in blechnum here it is perhaps not surprising some literature often supports *B. cordatum* as the correct name for *B. chilense*. Nearby was an *Eriosorus* sp., it looked like *E. hirtus* – except it was far too hairy. Several lycopods were common including *Lycopodium clavatum*. I am always a bit cynical about the same species occurring in Europe and the Americas but this looked identical to British material to me! Another widely distributed species, and common here, was *Asplenium monanthes*. The highlight, not far away, was possibly the rarest fern we saw all trip - *Asplenium theciferum* (photo pg. 13). A most un-asplenium-like asplenium, it was 10 to 20 cm tall, bi- to tri- pinnate with fleshy, linear lobes. The sori are in pockets at the tip of each segment.

We stayed the night in Loja, a pleasant town. A short drive the next morning took us to the Podocarpus Forest National Park. This was a very special Podocarpus forest – we saw NO Podocarpus! (There were some newly planted saplings!) I believe there are still some trees in remote areas outside our range. Never mind. This was the best site to date! Real rain forest! We were only at about 2800 metres but there were plenty of tree-ferns and filmy ferns including the beautiful brownish, congested fronds of *Hymenophyllum multialatum*, with orange brown hairy indusia. Sadly we did not have enough time here,

perhaps an hour when two days would not have been enough. Ferns were everywhere. Occasional on track-side banks was *Grammitis heteromorpha* (photo below), superficially looking like *Asplenium trichomanes* with branched fronds! *Blechnum binervatum* subsp. *fragile* was climbing many trees with the newly flushed fronds a stunning pink. On the way back down to the road we made a stop to see *Maxilaria* sp., an orchid which was unfortunately virtually over. At the same spot I acquainted myself with *Lycopodium jussiaei*, *L. glaucescens* and *L. vestitum*. *L. clavatum* was also there! This was the last botanical stop of the day. After leaving the park we followed one of the main roads from Ecuador south towards Peru. Well short of the border we stayed the next two nights in The Hosteria de Vilcabamba. Delightful hotel with a swimming pool – but no time to use it!



Grammitis heteromorpha

Photo courtesy of Martin Rickard

If the day before had been good, the next day was fabulous! Our target area was Cerrado Toledo, not far from Vilcabamba but most of the way was on an awful track. Together with birding stops it must have taken 2 to 2 1/2 hours to get to the top. We passed masses of ferns on the way up but it was the summit area

I wanted to see. We had been promised high altitude heath, and that's what we got! The vegetation was amazing. Bromeliads everywhere were full of water making exploration a very wet job even though the herbage was only about 2 feet tall! Here I found my first tree blechnum for the trip. It was beautiful (of course!) with a maximum trunk height of about 2 feet. The blechnum part of Flora of Ecuador has not been printed yet so I was not sure what it was but it looked like the Venezuelan *B. colombianum*. I now know I was wrong. It has been identified by Robbin Moran as *B. auratum* subsp. *auratum* from my photograph (photo pg. 13). (*B. columbianum* has been sunk into *B. auratum* as *B. auratum* subsp. *columbianum*, so I was close!) Just for good measure it had an unidentified hymenophyllum growing on the trunks. Huperzias were common as was a rather splendid dwarf polystichum. Several stunted plants of *Lophosoria quadripinnata* were scattered around, but it was not until I returned home I discovered I was in the only area where the very distinct variety *L. quadripinnata* var. *contracta* grows. Not only did I not see it but I did not even look out for it! There were so many ferns everywhere you look I could easily have missed it.

The weather at Cerro Toledo was a bit misty and moist but most of the time the beautiful mountains of the Andes could be seen undulating as far as the eye could see. What we could not see was any significant sign of man. No houses. No fields. Just very occasional cleared areas of forest in the far distance. We were truly in a wilderness. I loved it! My altimeter told me we were at about 3100 metres but the distant hills were much higher.

Our next day was very interesting but nevertheless a bit of an anticlimax for a fern lover! We travelled far south west of Loja to within a few miles of the Peru border to a semi-

desert area near El Empalme to see some rather special trees. They were baobabs, or close relatives, rather splendid with their bottle shaped trunks with green photosynthetic bark. I only saw one species of fern. It's a species of *Adiantum* cooked to a crisp! Not my favourite day of the trip! To be continued....

Ferns and Fern Allies of Taiwan

By Ralf Knapp ~ 2011

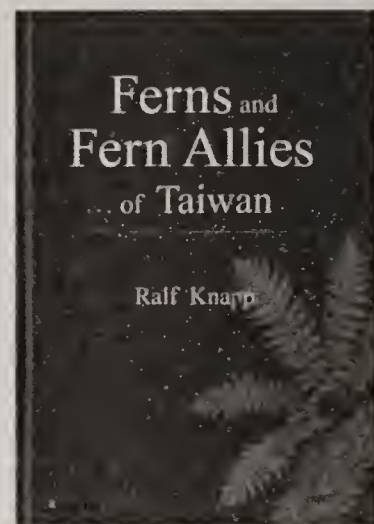
1052 pp., 4700 colour images

**KBCC Press & Yuan-Liou Publishing
Taipei, Taiwan**

Tim Pyner

Southend-on-Sea, England

Taiwan is one of the most fern rich islands in the world. Fortunately for pteridologists, Taiwan is also one of the better researched areas in Asia. Several Floras and popular photographic guides are easily accessible to both visitors and growers alike. These will now be surpassed with the publication of this magnificent new book. The author has amalgamated much existing information with large amount of new research and discoveries. Ralf Knapp originally envisaged a field guide, however weighing over 2 kilos this is a manual, presenting the current knowledge of Taiwanese ferns in one immense volume. I find it quite remarkable that the author can have completed this book within 7 years. To find over 700 species, many very rare or inaccessible, photograph them in detail, carry out the research, prepare the keys, collate a huge amount of additional information and then produce this beautiful book is an incredible achievement.



On opening the book it is important to read the introduction as here one finds the explanation of the layout and abbreviations. These are helpfully summarised inside the end boards. The taxonomic system used is that of Kramer and Green (1990). Molecular evidence has resulted in many changes to fern classification since then and when searching for specific genera or species one has to bear this in mind. As an example of the sort of additional and useful information included, there are a couple of more recent familial classifications located in the comments section later in the book.

The next section includes a glossary, beautifully illustrated with thumbnail photographs. This creatively shows how outmoded the traditional botanical glossary is, proving how a simple picture can provide so much more clarity than a few words.

This is followed by the keys to the families, genera and species. These are fully illustrated with thumbnail photos. Each species has usually 4 or 5 photos showing important diagnostic features. There are no descriptions apart from brief diagnostic details at

each step of the key. The families are laid out alphabetically as are the genera. It is important to remember that the Woodsiaceae are included in the Dryopteridaceae and many polypodiaceous genera are lumped into Polypodium under the Kramer and Green system. The photos of species in the larger genera are often several pages away from their place in the key.

When I first looked through the book I was unsure of the layout and methodology. However as I became familiar with the system I found that it worked reasonably well. I have keyed out several cultivated species and found the keys work effectively. I would love to have an opportunity to try them out in Taiwan. The photos are mostly very good although I think some are rather dark and their small size could prove a problem to some.

There then follows a comments section which is a mine of information. Here the author offers snippets such as his choice of names, alternative taxonomy and newly recognised species. Tucked away here are several new combinations that appear to be validly published. It would have been useful if these had been summarised elsewhere in the book as they are easily overlooked. This section is followed by a long and useful list of references.

The reader would usually by now be very happy, satisfied with a useful new field guide. However, they will now find that they have reached just over half way. The next 450 pages are full of wonderful photographs. The ferns selected for this section are of species new to Taiwan, species pending identification, critical taxa, invasive species, species from neighbouring regions that should be expected in Taiwan and poorly documented taxa. These photos are much larger and many occupy a full page. This final section takes this book onto another level and leaves the reader yearning to visit the island.

This astonishing flora must be seen as a milestone in pteridology and a benchmark for future floras to aim for. The author should be congratulated for producing such beautiful and useful book.

Ref. Kramer K.U and Green P.S.(1990) in Kubitzki K, The Families and Genera of Vascular Plants Volume 1 Pteridophytes and Gymnosperms.

Welcome New Members!

Rebecca Bernardos
Peter deArteaga
Vickie Edwards
Carol Grimes
Janet Heubach
Jan Jeddeloh

Mark Lawrence
Elizabeth Rodgers
Carrie Sparlin
June Stinson
Mike Uckotter



International Field Meetings

South East USA ~ Part II

17 June – Shake-a-rag Trail, Mouteagle, Sewanee Natural Bridge State Park and Tennessee River Gardens and Nature Preserve, Chattanooga, Tennessee

Michelle Bundy

Today's agenda was packed full of fabulous things to see! We began the day with a hearty breakfast at the Smokehouse Inn. Although this was only the fourth day of the trip many of us were already feeling full from the three square meals a day we had been consuming. I, of course, could not resist the country ham, red-eyed gravy and biscuits. Graham Ackers and Martin Rickard on the other hand were hoping for something a bit lighter, perhaps some fruit and yogurt. They kindly asked the waitress if this was an option and she replied, "Honey, there ain't nothing healthy here in Tennessee!" Suffice it to say they both got into the spirit of things and ordered the house special, including grits.

Our first stop was the Shake-a-rag Hollow Trail. Back in the 20's and 30's this hollow was home to bootleggers minding their stills of bubbling moonshine. If authorities were spotted they would shake a rag in the air to alert their partners in crime. We actually did see one old rusty still.

The trail itself is about 3 miles round trip. It's a fairly easy hike although there is a steep rocky traverse, towards the end, with an elevation change of about 300 feet. The trail wanders among boulders and big trees along the side of the mountain. The Civilian Conservation Corp originally built the trail in the 1930's, and in parts of the trail large old growth trees can still be found. It has remained virtually undisturbed by humans and as we found out, boasts an amazing diversity of wildflower and ferns.

The first fern spotted was *Asplenium montanum*. (photo pg. 12) Further on we saw *Iris cristata*. Iris is the state flower of Tennessee. As we continued I could hardly keep up, jotting down one discovery after another, *Sassafras albidum*, *Thelypteris noveboracensis* and *Polystichum acrostichoides*. We were all excited to see *Botrychium virginianum* but by mid-way through the trip, this fern was old news. Can you imagine! We were beginning to warm up, not from the exhaustive hike but from the stifling humidity. We continued along to see *Asplenium platyneuron*, *Hepatica acutiloba*, *Asplenium rhizophyllum*, and one of my favorites, *Goodyearia pubescens*. Jose Aguirre spotted ferns in the gully below and scrambled down to find a large stand of *Osmundastrum cinnamomeum*. Further along we saw *Athyrium asplenioides*, *Dryopteris marginalis* and *Cystopteris protrusa*. An interesting find, new to most of us was Indian cucumber root or *Medeola virginiana*, with its whorled leaves and star like flower. This plant produces a crisp, edible tuber that smells and tastes like garden cucumber. Mid-way along the trail was a massive rock, dripping with Polypodium. After some discussion, it was determined by Martin that this was *Polypodium appalachianum*. Beyond this we recognized beech fern or *Phegopteris hexagonoptera*. This medium-sized fern has attractive leaves and can be distinguished from other ferns by its winged rachis. Near the finish of our trek we

spotted *Asplenium rhizophyllum*, tightly nestled on a cushiony, moss covered rock. As we came to the end of the trail we encountered the steep rocky traverse. Like a well-oiled machine we worked together to get everyone safely to the top. Before hopping on the bus we stopped to admire the beautiful view of Green Valley.

Lunch was next on the agenda. This was hosted at the lovely and rustic home of Betty Nelson, a lifelong friend of Wim Burnett's. We relaxed, enjoyed the view and then walked down the road a spell to Sewanee Natural Bridge State Park. Ever fern vigilant, we did see *Osmundastrum cinnamomeum*, *Osmunda regalis* and *Polystichum acrostichoides* along the road.

Natural Bridge is a 25 feet high natural sandstone arch with a span of 50 feet set in a three-acre natural area in Franklin County. Here we were promised another glimpse of the very difficult to find, *Trichomanes boschianum*. Our efforts were rewarded. In addition to *T. boschianum*, we saw *Asplenium montanum* and *Athyrium asplenoides*. (photo pg. 12) One of the interesting things at this site was to see the *Osmundastrum cinnamomeum* growing out of the sandstone crevices. You really had to do a double take, as these ferns looked so foreign growing in this setting.

Our last stop of the day was the Tennessee River Gardens and Nature Preserve in Chattanooga.

As you drive the narrow and windy road into the preserve the first thing you see is a 50 acre lake created from the backwater of the Tennessee River. There was a collective sigh of relief as Gus our bus driver, after careful maneuvering, once again, got us where we needed to be. This gated wildflower garden and wildlife preserve sits in the heart of the Tennessee River Gorge. It is dedicated to the education and enjoyment of students and residents in the surrounding Chattanooga area. There were many different fern species and cultivars here...far too many to list. They were all small and newly planted. It would be interesting to see this site 5 years from now.

The most noteworthy fern we saw was *Pleopeltis polypodioides*. There were many large clumps that had been successfully transplanted onto the existing rock. We walked the trails and enjoyed the many man-made waterfalls which fed into a small trout pond from all corners of this planted area. Before saying our good-byes, Martin presented Bob Caldwell with Sue Olsen's Encyclopedia of Garden Ferns. He was delighted to receive it.

This outstanding day was topped off with a delicious dinner at a local restaurant, compliments of Naud and Wim. Good food, good friends...more ferns tomorrow. What could be better?

18 June – Great Smoky Mountains State Park

Pat Acock

As the coach had to fill with petrol we took the opportunity of having breakfast on the road. Setting off a little later we travelled many miles through the beautiful Tennessee wooded countryside, eventually following a long winding river course in the Great Smoky

Mountains State Park. The winding trail led to one of our number feeling a little sick and a judicious rest stop was called for and in this secondary forested deciduous river gorge with a predominance of *Liriodendron tulipifera* we saw *Polystichum acrostichoides* and *Asplenium platyneuron*. It took another hour to reach the park visitor center where an enquiry as to whether they stocked the book, '*Ferns of the Smokies*' by Murray Evans saw a sudden stampede for copies. Only our leader Naud Burnett failed to acquire one. As we left the center heavy rain set in and as we were running behind schedule we drove on and did not manage the walk in this part of the park. We arrived at the Natural Bridge State Park Resort and managed a walk out around Hoe Down Island in the evening after our dinner.

19 June – Natural Bridge State Park

Pat Acock

A seriously wet morning greeted us and the weather forecast showed tornado warnings in the county due west. Our ranger for the day, David Taylor advised that it would not be sensible to attempt to go out until at least the thunder and lightning stopped and the forecast improved. Naud managed to hire the conference room and a projector. I managed to show my *Asplenium* triangle talk and Martin gave two presentations one on tree ferns and the other on *Polystichum setiferum* cultivars and in particular his finding of the *Crawsfordburn Fern* in Northern Ireland, one of the choicest of these cultivars.

Richie Steffen prepared a talk for after an early lunch. However the weather improved dramatically and although some did not go out David Taylor led us out to see what some of us had come a long way to see, some of the allotetraploids of Herb Wagner's *Asplenium Triangle*¹. We were rewarded on our climb by seeing many of the common ferns but as we broke out on to the top rocky outcrops we were where the ferns were bound to be present. *Asplenium montanum* was soon seen and then with much discussion *Asplenium bradleyi* was discerned. Being called back by one of the late comers an obvious *Asplenium pinnatifidum* was added to the list. (photo pg. 12) There was much speculation as to whether we had various back crosses with the parents by these two allotetraploids and looking back through my many pictures I am sure there are good candidates for these. We proceeded on to the Natural Bridge, the second of these we had seen on this trip. After observing Natural Bridge from a vantage point we retraced our steps to it and descended down a different trail towards our lodge. We had only descended around 30 feet when we came across the most superb *Asplenium pinnatifidum*. After photographing it I turned it over to see the whole underside covered in spores waiting to dehisce. Further along the cliff side was covered in small plants of *Asplenium pinnatifidum*.

After dinner and possibly a little too late for photography we climbed up the Rock Garden Trail and beside all the common ferns of these woodlands saw of note, *Dryopteris goldiana*, very large *Asplenium rhizophyllum* and *Asplenium trichomanes*. This was one of those days I had been looking forward to for many years and reflecting in the evening it was doubtful if it could have been bettered.

20 June – Ralph Archer Woodland Garden at Whitehall Manor

Louisville, Kentucky - Pat Riehl

Still in Kentucky! After a while one forgets where one is. On the bus at 8am and it is thunder and rain this morning. We have a two hour drive. Our destination is Whitehall Manor and Gardens.



Whitehall Manor - Photo courtesy of Richie Steffen

The house was built in the 1850's, renovated in 1909 and 1970 when it changed owners. Presently it is part of the Historic Homes Foundation. Our destination was the fern garden, The Ralph Archer Woodland Garden, a Hardy Fern Foundation affiliated garden. Started in 2002 it covers about 1/4 acre. Named after its creator, the fern garden is a tribute to the hard work and dedication of Ralph and volunteers. It is a garden that developed over time with plants added as the budget allowed. The garden can be thought of as two gardens: the older part planted under large trees with deep shade and dry soil, the newer garden with more light and water due to being in a boggy area and away from trees. The same genera of ferns are being grown in both areas to see the difference in growth between the two environments. The newer area was cleared of the euonymous ground cover without using herbicides. Instead a layer of cardboard was put down and covered with a thick layer of wood chips. After a year the ground was free of euonymous and had a nice layer of decayed wood chips. The other feature is a "Stumphedge." Old stumps, tree trunks



Whitehall Fern Garden - Tour led by Ralph Archer, far right.
Photo courtesy of Mike Hayman

and branches are settled among the ferns and used as pathway edging. Some of the stumps were planted with *Asplenium rhizophyllum* and *Polypodium vulgare*. The *asplenium* was beautiful, not a slug mark on it! The hope was to grow Victorian fern cultivars in this area of the garden. They planted 30 but alas most died. This may be due to the limey soil and the heat of Kentucky. The oldest ferns in the garden are *Dryopteris filix-mas* 'Barnesii' and *D. filix-mas* 'Cristata Martindale.' Through trial

and error Ralph learned *Cyrtomium falcatum* and many polystichums did not do well. For texture both gardens were planted with hostas, lilies, hellebore, astilbes, dicentras, tiarellas and heucheras.

And if that wasn't enough Whitehall treated our group to a lunch served in the manor



Asplenium pinnatifidum

Photo left courtesy of
Richie Steffen

Asplenium x kenzoi

University of North Carolina Charlotte

Photo below courtesy of Sue Olsen



Woodwardia areolata

South Carolina BG

Photo above courtesy of
Sue Olsen

Athyrium asplenoides

Photo below courtesy of Richie Steffen



Asplenium montanum

Photo above courtesy of Sue Olsen



Asplenium theciferum

Photo left courtesy of Martin Rickard

Blechnum auratum
subsp. *auratum*

Photo right courtesy of
Martin Rickard



Lycopodium digitatum
Southern running pine

Photo left courtesy of Carl Taylor

Fertile *Osmunda regalis*
University of North Carolina Chapel Hill
Photo right courtesy of Sue Olsen



Dicksonia sellowiana

Photo left courtesy of
Martin Rickard

It was such a treat to sit in a beautiful house at carefully laid tables and enjoy a peaceful lunch. After lunch Dr. Lightly, past director of the Mt. Cuba Center in Delaware, was kind enough to give us an entertaining slideshow entitled 'My descent into the madness of ferns.' Many participants had enjoyed a visit to his extensive personal fern garden, Springwood, on the Northeast fern tour several years ago. He finished with a little test. Could anyone identify the ferns he showed on the screen? Graham Ackers and Martin Rickard topped the winner's list.

At this point Michelle Bundy and Jose Aguirre left the tour and we rode the 250 miles to Tennessee.

21 June – Fall Creek Falls State Park, Tennessee

Richie Steffen

The first day of summer was to be spent at Fall Creek Falls State Park in Tennessee. The park covers over 20,000 acres on the Cumberland Plateau with rugged landscapes and large areas of virgin hardwood deciduous forests. Our lodging was at the state park inn, starkly built in the no-frills brutalism style of architecture occasionally and more kindly referred to as eclectic modernism. The harsh and rigid poured concrete lodging stood out against the lush diverse forest and lake surrounding it in shocking contrast. The sweltering hot day started with temperatures in the mid 90°F with very high humidity. The goal of the day was to hike to the base of Fall Creek Falls, a short mile and a half trail, with a steady descent to the pools at the bottom that would need to be traversed up on our return. Arriving at the trailhead we were greeted by a spectacular overlook onto the plunging waterfall. Falls Creek Falls drops 256 feet and is the highest waterfall in the eastern United States. Over the years a large circular bowl-shaped pool had been carved out by the plunging water beckoning one to venture down to enjoy the cooling mist.

Starting down the trail we saw several ferns common to the Southeast, but a well-weathered sandstone cliff held a colony of *Asplenium montanum* with some of the largest fronds we found on the entire tour with a few measuring up to eight or ten inches wide. A short way down the trail was a second smooth-sided cliff with an enormous block that had sheared off creating a narrow gap between the cliff and the dislodged rock. A slow steady seep drained down the cliff keeping the narrow gap moist, but surprisingly fern free. Although there were few ferns to be found, this moist narrow gap acted like an air conditioner with a steady stream of cool air spilling from the bottom onto heat weary hikers. It was a nice break on the way down, but on the uphill return it was an essential stop to cool down.

Asplenium rhizophyllum was found in small colonies growing on rock rubble. Near a particularly attractive patch of the walking fern were a few more young *Asplenium montanum* along with an odd looking young plant of what was possibly *Asplenium x bradleyi*, although it was too poorly developed to confirm its identify. Another treat was a single lovely specimen of *Osmunda regalis* found near the bottom pool surrounded by the lacey flowers of a very nice form of the native *Hydrangea arborescens*. Over the

course of the day 14 different ferns were found, most being the typical species found throughout the Southeast.

22 June – Blue Ridge Parkway

Jack Schieber

On this day we walked trails originating from the Blue Ridge Parkway. The Parkway is a 2-lane roadway which winds among the highlands of the south Appalachian Mountains 469 miles from Waynesboro, Virginia to the Cherokee Indian Reservation in North Carolina. It passes near Mt. Mitchell which, at 6684 feet elevation, is the highest peak in eastern USA. The Parkway is spotted with auto pullouts for viewing the irregular mountainous countryside and is a particularly attractive drive for viewing flora peculiar to the high country. We noted flame azaleas (*Rhododendron calendulaceum*) and mountain laurel (*Kalmia latifolia*) in bloom.

Our guide and host was Tom Goforth, a retired college professor, fern nurseryman and fern researcher. The name of his nursery, Crow Dog Native Ferns and Garden, refers to his longtime interest in the religious history and culture of the Native Americans. ‘Crow Dog’ was the name of an Indian chief whose life demonstrated a unique kind of courage.

Our first stop was Standing Rock Turnout where we noted how the differences in geology affect plant life. Tom talked about areas of granitic gneiss, an acidic rock, and the more alkaline mesic rocks, which, in the process of formation and wearing away, become intermixed so that top soils can be a complex mix of minerals. The soil in regions with alkaline limestone outcrops can be composed of more acidic granitic components which can explain why we sometimes find acid-loving ferns growing near lime-loving ferns.

At Bearpen Gap Turnout we noted variations in the width and length of pinnae and pinnules of *Dryopteris campyloptera* which suggests a genetic difference from the more classic form which grows farther north in the U. S. and in Canada. *D. campyloptera* grows only at elevations above 4000 feet in this southern region. We also found that the Southern Lady Fern, *Athyrium asplenoides*, growing below 4000 feet has the more classic lanceolate form while that growing higher was coarser and more triangular. We also noted a similar variation in *D. intermedia* and we realized again the continuous gradation of form in ferns and their hybrids.

Our last stop was at Shining Rock Wilderness where we climbed to 6200 feet elevation where the trees were stunted and plant life more restricted. Here we saw lady fern, hay scented fern and mountain wood fern surviving in the harsh sunny environment. My count for the day was 11 species of ferns.

23 June – South Carolina Botanical Garden

Sue Olsen

Our morning began with the surprising announcement that our previous day’s guide had cancelled his plans to lead us and we would not be able to visit his nursery nor the

anticipated field sites. We were not to lose the day's ferning, however, as our dedicated participants went into full research mode. Fortuitously a guide book search turned up the South Carolina Botanical Garden that not only was within a reasonable distance of our day's destination but listed among its features "wildflower, fern and bog gardens". We were on our way!

The drive continued to showcase the beauty of the Smoky Mountains as we headed south towards the garden which is on the campus perimeter of Clemson University (no doubt better known in the U.S. for its athletic accomplishments than for its botanical garden)! Originating as a camellia preserve in 1958, the garden grew in size and scope to its present 295 acres and was designated as the South Carolina Botanical Garden in 1992. Highlights include an arboretum, multiple nature trails especially through wooded areas nourished by streams, a sculpture garden including some whimsical surprises and is home to one of the National Hosta Society's display gardens, which I might add is a beautiful collection of outstanding selections. The garden is open from dawn to dusk daily with no charge. There is a highly regarded geology museum on the property as well. It is open several days a week and does have an admission charge.

Our eager group assembled in the visitor's center and then dispersed to various areas of interest from the gift shop to the wild areas of the ferny woodlands. By taking trails, one of which was labeled as the fern garden, through the woods I was pleased that we were able to count well over a dozen natives plus the now seemingly ever present escape, *Cyrtomium falcatum*. The ubiquitous Christmas fern (*Polystichum acrostichoides*) was as usual the dominant forest understory fern. However, the prize for the beauty queen of the day went to *Woodwardia areolata* which spread an ornamental swath along the stream beds in the woodlands. (photo pg. 12) Another prize was *Lycopodium obscurum*, which was a delight as it colonized slowly across the forest floor. All of these ferns were in the wild area. Unfortunately we only had time to explore a limited portion of the gardens. We did, however, feed from the wild garden into the well maintained and varied hosta test area and here we found a great assortment of non-native ferns common in cultivation. Not surprisingly these included my original intro to the enticing fern world, *Dryopteris erythrosora*, the autumn fern. Other ferns displayed included an attractive, exceptionally white form of *Athyrium niponicum* 'Pictum'... 'Silver Falls' perhaps?

As our allotted time expired we converged from various paths in a timely fashion to continue our journey to Greenville, SC, for very comfortable accommodations in the La Quinta Inn as well as a pleasantly social evening meal at a local eatery. It turned into yet another very delightful day.

24 June – University of North Carolina & Duke University, Durham

Graham Ackers

Checking out of our South Carolina hotel, we travelled the 110 miles to the McMillan Greenhouse complex within the University of North Carolina, Charlotte. Here we were welcomed by resident botanist Dr. Larry Mellichamp who throughout our morning visit proved a most affable, enthusiastic and knowledgeable host. Although he is an expert on *Sarracenia* pitcher plants, many of which were on display, he proved to be very

knowledgeable on many other botanical topics. Together with his colleague Paula Gross, he had written “*Bizarre Botanicals*”, a splendidly quirky and informative book published by Timber Press in 2010. The plants featured in the book were on display throughout the area, together with interpretive material explaining their “bizarreness”. The greenhouse complex consisted of a courtyard area, and several thematically oriented glasshouses featuring plants of ancient lineage, succulents, plants of economic importance, orchids, and rainforest plants. Each area benefitted from splendid environmental control systems resulting in the fine healthy plants on display. Specimens of the fern species featured in the book were on display – *Asplenium bulbiferum*² (actually *Asplenium x lucrosum*), *Azolla caroliniana*, *Microsorium thailandicum* (with its wonderful metallic blue sheen) and *Psilotum nudum*. But there were many other ferns in the greenhouses – davallias, adiantums, polystichums, a splendid *Angiopteris*, a densely and crisply foliaged “*Nephrolepis densiflora*” (probably a cultivar of *Nephrolepis exaltata*) and the beautifully cut serrated Japanese Walking Fern *Asplenium x kenzoi* (*Asplenium prolongatum* x *A. antiquum*). (photo pg. 12)

Following our admiration of the greenhouses, Larry accompanied us to the outdoor garden areas, the first of which was the wooded Harwood Garden featuring plants from around the world, with special emphasis on those from China and Japan. There were plenty of ferns to admire. Larry pointed out a strain of *Matteuccia struthiopteris* which was particularly heat tolerant and therefore able to form a fine display in the garden. There were osmundas, cyrtomiums, and some plants of *Dryopteris sieboldii*, which we were informed grew very well (gardeners in cooler more northern climes find this species very slow). Amongst a large display of athyriums was a dwarf variety of *Athyrium niponicum* which was a novelty for us, and prompted a couple of our party to take some (with permission of course) for further study. Having briefly inspected the Asian Garden under the searing southern heat, we moved to more equable woodland in the Van Landingham Glen, featuring hybrid rhododendrons and about 1000 native plants of the Carolinas. About 60 of these were pteridophytes, some noted being *Osmundastrum cinnamomeum*, *Dryopteris x australis* (very common in all gardens visited) together with its two parents *D. ludoviciana* and *D. celsa*, a large understory of *Thelypteris noveboracensis*, and stands of *Woodwardia areolata*. Some plants of the latter were straying onto the path, and were weeded out for onward cultivation by some of us – again with permission of course!

To finish the morning we returned to the greenhouse complex, where Larry and Paula signed many copies of their “*Bizarre Botanicals*” book purchased by tour members. We then collected our packed lunches which had been delivered there, and headed for the coach to eat our lunches whilst heading for our next destination – the Duke University in Durham, N. Carolina.

When we arrived at the Sara P. Duke Gardens, most of the party initially headed for the well-stocked visitor center shop. There, amongst other purchases, some of us bought a couple of very attractive fern prints, taken from their herbarium specimens. The gardens themselves were quite large and divided into 4 major areas. Unfortunately we were short of time, and were only really able to explore part of one of the areas – the H. L. Blomquist Garden of native plants. This was entered via an ornate wooden arch beside

which were interpretive displays indicating what to see in the garden, the importance of native plants, etc. The rolling woodland terrace of this 6.5 acre garden apparently contains more than 900 species and varieties of regional native plants. With the onset of light rain, some members of the party decided to head back to the coach, but in fact the rain petered out after a short time. The pteridophytes were confined to a relatively small area of this garden. Most of the modest collection was commonly cultivated in gardens visited previously, but slightly more unusual were *Cheilanthes lanosa*, *Woodsia obtusa* and *Lycopodium obscurum*.

After a short ride, we arrived at another University of North Carolina affiliated institution, the NC Botanical Garden at Chapel Hill. The garden was fronted by an impressive Education Centre, architecturally modern and “green”, completed in 2009, which included a good bookshop. The mission of the garden is “*To inspire understanding, appreciation, and conservation of plants in gardens and natural areas and to advance a sustainable relationship between people and nature.*” Supporting this mission was an impressive collection of native ferns contained in a wooded part of the garden. I counted a total of 22 taxa, many of which benefitted from interpretation boards explaining their biology, morphology, distribution etc. Some of note were *Dryopteris ludoviciana*, *Woodwardia areolata*, *W. virginica*, *Deparia acrostichoides*, *Diplazium pycnocarpon*, *Woodsia obtusa*, *Cystopteris bulbifera* and *C. protrusa*, all in fine stands. However our enjoyment was slightly hampered by the attentions of some biting insects, fortunately rarely experienced elsewhere during our tour. On leaving the fern collection we viewed other parts of this impressive garden, including some raised beds containing water lilies, bogs with sarracenias, and native habitat reconstructions, all with excellent interpretive boards. Our visit concluded with an inspection of their plant sales, which we resisted!

1 Wagner WH Jr. (1954) Reticulate Evolution in the Appalachian Spleenworts. *Evolution* 8: 103-118

2 Ackers RG The Strange Case of *Asplenium bulbiferum*. *Pteridologist* 5: 240

HFF Spore Exchange List ~ 2012

Welcome to our 2012 Spore List! Spore varieties will continue to cost 50 cents each. Orders may continue to include a mailer with postage –or—the new option is that orders may instead include \$1.25 for a padded mailer and/or \$1.50 for postage inside the U.S. or \$2.50 for international postage.

We will no longer request or accept international postage coupons. Please include your email address so we can communicate at fernspores@hotmail.com. Also, please consider contributing spores to our exchange if you have the opportunity to collect spore that others might enjoy growing. Thanks for your support!

**Please make checks payable to Carolyn Doherty/ HFF Spore Exchange Director.
1905 43rd St. SE, Puyallup, WA 98372.**

Genus, species	var. or cv.	Year	Donor(s)
<i>Adiantum aleuticum</i>		'11	Doherty
<i>Adiantum aleuticum</i>	'Subpumilum'	'07, '10, '11	Jeddeloh, RSF
<i>Adiantum aleuticum</i>	'Imbricatum'	'11	Duryee
<i>Adiantum thalictroides</i>		'09	EMBG
<i>Arachniodes davalliaeformis</i>		'10	Olsen
<i>Arachniodes simplicior</i>		'11	RAS
<i>Arachniodes simplicior</i>	'Variegata'	'11	RSF
<i>Arachniodes standishii</i>		'11	Jeddeloh
<i>Asplenium trichomanes</i>		'11	Taylor
<i>Athyrium filix-femina</i>	'Frizelliae'	'11	RSF
<i>Athyrium niponicum</i>	'Pictum'	'11	RSF
<i>Athyrium otophorum</i>		'11	Doherty, Jeddeloh
<i>Athyrium vidalii</i>		'09	EMBG
<i>Blechnum chilense</i>	Red Form	'09	RSF
<i>Blechnum discolor</i>		'11	EMBG
<i>Blechnum niponicum</i>		'11	RSF
<i>Blechnum spicant</i>		'11	Doherty, RSF
<i>Blechnum spicant</i>	'Rickard's Serrate'	'10, '11	RSF, Duryee
<i>Cheilanthes eckloniana</i>		'11	Olsen
<i>Cheilanthes lanosa</i>		'10	Peachey
<i>Cheilanthes quadripinnata</i>		'10	Olsen
<i>Cryptogramma</i>	sp.	'11	Duryee
<i>Cyrtomium fortunei</i>		'10	Peachey
<i>Cyrtomium lonchitoides</i>		'11	RSF
<i>Cyrtomium macrophyllum</i>		'11	RSF
<i>Cyrtomium macrophyllum</i>	var. <i>tukusicola</i>	'10, '11	RSF
<i>Dryopteris arguta</i>		'07	RAS
<i>Dryopteris bissetiana</i>		'11	RSF
<i>Dryopteris carthusiana</i>	'Cristata'	'09	EMBG
<i>Dryopteris crassirhizoma</i>		'11	RSF
<i>Dryopteris crispifolia</i>		'11	Olsen
<i>Dryopteris decipiens</i>		'10	RSF
<i>Dryopteris dickinsii</i>	'Crispa'	'11	Olsen
<i>Dryopteris erythrosora</i>		'08, '11	Riehl, RSF
<i>Dryopteris filix-mas</i>		'07	unknown
<i>Dryopteris hondoensis</i>		'09	EMBG
<i>Dryopteris intermedia</i>		'11	Rickard
<i>Dryopteris ludoviciana</i>		'05	unknown
<i>Dryopteris marginalis</i>		'08, '11	RSF
<i>Dryopteris namegatae</i>		'05	RSF
<i>Dryopteris sacrosancta</i>		'05, '11	RSF
<i>Dryopteris tokyoensis</i>		'10	RSF
<i>Dryopteris wallichiana</i>		'11	Duryee

Genus, species	var. or cv.	Year	Donor(s)
<i>Gymnocarpium oyamense</i>		'11	RSF
<i>Matteuccia intermedia</i>		unknown	Gottlieb
<i>Pellaea atropurpurea</i>		'11	Duryee
<i>Phyllitis scolopendrium</i>		'11	Doherty
<i>Phyllitis scolopendrium</i> var. <i>Americanum</i>		'07	Avery, Gottlieb
<i>Phyllitis scolopendrium</i> 'Cristata'		'11	EMBG
<i>Phyllitis scolopendrium</i> 'Saw Blade'		'11	Doherty
<i>Polypodium glycyrrhiza</i>		'10, '11	Doherty
<i>Polypodium interjectum</i>		'10	RSF
<i>Polypodium vulgare</i> ex. NE Turkey		'09	RAS
<i>Polypodium vulgare</i> 'Bifidum'		'11	EMBG
<i>Polypodium vulgare</i> 'Cornubiense'		'11	EMBG
<i>Polystichum acrostichoides</i>		unknown	unknown
<i>Polystichum aculeatum</i>		'05	RSF
<i>Polystichum andersonii</i>		'09	EMBG
<i>Polystichum braunii</i>		'07, '11	Peachey, Taylor
<i>Polystichum californicum</i>		'05	RSF
<i>Polystichum imbricans</i>		'07	RAS
<i>Polystichum imbricans</i> 'Ramosum'		unknown	unknown
<i>Polystichum lonchitis</i> cw Scotland		'10	Olsen
<i>Polystichum makinoi</i>		'10	Peachey
<i>Polystichum munitum</i>		'11	Doherty
<i>Polystichum neolobatum</i>		'11	RSF
<i>Polystichum multifidum</i>		unknown	RCH
<i>Polystichum retroso-paleaceum</i>		'10	RSF
<i>Polystichum stenophyllum</i>		'10	Olsen
<i>Polystichum tsus-simense</i>		'11	RSF
<i>Polystichum vestitum</i>		'10	Olsen
<i>Polystichum xiphophyllum</i>		'07	RSF
<i>Pteris cretica</i> 'Albo-lineata'		'11	Doherty
<i>Thelypteris palustris</i>		'11	Baxter
<i>Woodsia fragilis</i>		'11	RSF
<i>Woodsia intermedia</i>		'11	RSF

Avery Don Avery, Vermont,
Doherty Carolyn Doherty, Washington
Duryee Sylvia Duryee, Washington
EMBG Elizabeth Miller Botanical
Garden, Washington
Gottlieb Joan Gottlieb, Pennsylvania

Jeddeloh Jan Jeddeloh, Oregon
Olsen Sue Olsen, Washington

Peachey Harold Peachey, New York
RAS Richie Steffen, Washington
RCH Randall Hitchin, Washington
Rickard Martin Rickard, UK
Riehl Pat Riehl, Washington
RSF Rhododendron Species
Botanical Garden, WA

Taylor Jeanie Taylor, Washington

The Ravine Experience at the Bellevue Botanical Garden ... take a walk on the wild side!

Nancy Kartes, Bellevue Botanical Garden Manager

We intuit that walking in the woods is good for us. Science explains why: strolling through forests boosts our immune systems by exposing us to antimicrobial volatile organic compounds derived from trees. The Japanese call this “forest bathing”, which sounds much more inviting than “exposure to antimicrobial volatile organic compounds!”

An exciting new project lies in the heart of the forest at the Bellevue Botanical Garden. A new half -mile nature trail crosses a deep ravine into the most pristine of our wild spaces. Engineers are building a 150' suspension bridge to span the ravine. This will allow visitors to observe unique topography, native understory, wildlife, and soaring conifers without disturbing the forest floor.

Featured in our original master plan, the project was revised during the 2008 master plan update. Construction began in September and the Ravine Experience will open to the public this spring. In the meantime, visitors may watch the construction from an observation area on the west side of the Ravine trail. The project is made possible through a combination of private donations and 2008 Parks and Open Space Levy funding.

Come on down and take a walk on the wild side ... it's good for you!



Fern Foray to the LaBarque Creek Watershed, Jefferson County, Missouri

Carl Taylor, Arlington, VA
Sue Hollis, Kansas City, MO

The Annual Foray of the American Fern Society was held on Saturday, 9 July, in connection with the Botanical Society of America meeting in St. Louis, Missouri. The foray organizers and leaders were George Yatskievych from the Missouri Botanical Garden and Nels Holmberg a member of the Webster Groves Nature Study Society and Missouri Native Plant Society (Fig. 1). They did an outstanding job of organizing and executing this event.



Fig. 1 - Foray leaders, George Yatskievych, foreground, Nels Holmberg, background. (Photo by Fernando Matos, New York Botanical Garden)

The LaBarque Creek Conservation Area is located in the Ozark Highlands less than an hour drive southwest from downtown St. Louis. It is one of very few relatively unaltered permanent stream systems that still remain near the city. This watershed is a rugged, picturesque terrain of deep sheltered canyons, waterfalls, spectacular over-hanging cliffs and massive bluffs cut into the soft, thick layers of Ordovician-age St. Peters Sandstone. Fern habitats range from dry forests on the ridge tops including small exposed rock outcrops and glades down slope to moist ravines, vertical sandstone slabs, horizontal ledges, and streamside woodlands on canyon floors. There are nearly 800 species of vascular plants in the area. A total of 28 ferns and 5 lycophytes have been recorded from the sites we visited. We saw at least 18 of these species.

A mesic woods above a small stream with underlying soft sandstone marked the first site (Fig. 2). Almost as soon as we entered the woods along LaBarque Creek we found Christmas Fern (*Polystichum acrostichoides*), Ebony Spleenwort (*Asplenium platyneuron*), Common Scouring Rush (*Equisetum hyemale*), Rattlesnake Fern (*Botrychium virginianum*), Maidenhair Fern (*Adiantum pedatum*), Southern Beech Fern (*Phegopteris hexagonoptera*) and Common Horsetail (*Equisetum arvense*). There were small patches of Southern Fragile Fern (*Cystopteris protrusa*), still partly green because of the moist



Fig. 2. La Barque Creek Conservation Area. Our morning hike was in this area. (Photo by Fernando Matos, New York Botanical Garden)

spring weather. Higher up on the increasingly steep and drier slope we saw a few large fronds of Purple Cliff-brake (*Pellaea atropurpurea*) on a small rock outcrop. We left the trail briefly to visit a small glade-like clearing in the woods where we saw a fine population of Hairy Lip-fern (*Cheilanthes lanosa*) in the dappled shade of a large eastern red cedar and several large specimens of Blunt-lobed Woodsia (*Woodsia obtusa*). There was also a nice patch of prickly pear cactus in the clearing.

We then descended to the creek, where a series of ledges contained Common Polypody (*Polypodium virginianum*) and several nice clumps of Rock Firmoss (*Huperzia porophila*) the latter a rare plant for this region. Nearby there were also several colonies of Northern Lady Fern (*Athyrium filix-femina* var. *angustum*).

Along with the 14 or 15 species of ferns and lycophytes, we saw several interesting flowering plants characteristic of the area. Our leaders identified these as asked, and pointed out common or characteristic species for this area.

In the afternoon, we drove to the Don Robinson property, also in LaBarque Creek watershed, where we ate lunch in the shade of several large chinkapin oaks. Soon a tractor and trailer pulled up. We hopped in for a ride down slope to some interesting lycophytes and ferns. Our leaders took us to a small artificial clearing near the edge of the woods where a patch of southern running pine (*Lycopodium* or *Diphasiastrum digitatum*) was holding its own among some shrubby secondary growth. George and Nels explained that this species is far more common in the eastern U.S. and that this

population is a surprising discovery this far west. (Photo page 13)

Next we followed a path that took us above a moist ravine and up slope where we saw more Christmas Fern and Ebony Spleenwort, two of the more common ferns in the region. As we continued up a slope we soon spied a colony of the Netted Chain Fern (*Woodwardia areolata*) just below a small sandstone outcrop. As we scrambled back down the slope we found some really huge fronds of the Southern Beech Fern and many plants of the Sensitive Fern (*Onoclea sensibilis*). The sterile fronds of Sensitive Fern looked very like those of the Netted Chain Fern we had just seen except the frond edges of the Netted Chain Fern are minutely toothed, whereas the frond edges of Sensitive Fern are essentially smooth.

We headed further into the ravine and creek bottoms. On sandstone ledges along the creek we found more plants of the Rock Firmoss and several plants of the Tennessee Bladder Fern (*Cystopteris tennesseensis*). On a moist vertical sandstone slab above the Rock Firmoss we found several fruiting plants of Sullivant's Coolwort (*Sullivantia sullivantii*), a small plant in the saxifrage family that is almost completely restricted to sites not covered by Wisconsin glaciation. We rounded a bend in the creek and the brushy understory opened to give us a spectacular view of the high bluffs and magnificent overhangs looming above us with the clear stream at our feet. The image of a small colony of the Common Polypody perched on a huge juxtaposed boulder was a fitting climax to a phenomenal fun day in the field with ferns. Tired and well treated we headed back to St. Louis. Thank you George and Nels.

Osmunda japonica

James R. Horrocks

Salt Lake City, Utah

This interesting species is found throughout Japan and is also native to Korea, Sakhalin Island, Taiwan, Philippines, Thailand and Indo-China, and China where it ranges to the western Himalaya. Found in wooded areas in moist acid soil and part shade, it bears a striking resemblance to *O. regalis*, but does not seem to relish swampy conditions as does its regal cousin. It is not as hardy as *O. regalis* and is usually less than three feet tall, not attaining the size of *O. regalis*, which can be five feet or more in height. *O. japonica* also differs from *O. regalis* by being completely dimorphic, that is, the fertile and sterile fronds are totally separate, although, in late summer, some fronds may appear that display both fertile and sterile



components. In some regions, such as eastern China (Hong Kong) the dimorphism seems to be less so. Two varieties are recorded, *corymbiferum* and *divisa*.

Description: The rhizome is short and ascending, covered with the bases of old fronds. Cinnamon-brown hairs are present, with some darker blackish hairs mixed in, all being deciduous. The fronds are dimorphic, the sterile ones nearly three feet in length and tufted. The stipes, being one-third the length of the fronds, are straw-colored, smooth, and display a parchment-textured wing on each side of the base. The bipinnate fronds are ovate to triangular-ovate, hairless or nearly so. The pinnae are opposite each other, with finely serrate margins, and are oblong-ovate in outline. The lower pinnae are short and stalked. The pinnules are oblong to broadly lanceolate, with obtuse to acute apices and with spreading veinlets. The bases of the pinnules are obliquely truncated to rounded and attached directly to the costa. The shorter fertile fronds arise from the center of the plant, bearing paniculate, cinnamon-brown, dense sporophylls that are held more erect than the rather spreading sterile fronds that form a rather wide loose arrangement. Although this fern is usually strongly dimorphic, some fronds appear in late summer that combine both fertile and sterile attributes and in some areas such as Hong Kong, the plants are less dimorphic than the type. This species is deciduous but the fronds remain green after other *Osmunda* species have gone dormant. Spores are green. *O japonica* is a sexual diploid.

Culture: Although rare in the nursery trade, this fern grows well in moist acidic soil and part shade. Rush remarks that it “seems not to be particularly a waterside plant as *O. regalis* generally is.” Its hardiness may depend on its place of origin. Plants from northern China, Korea, or certainly Sakhalin Island would probably be hardier than those from more southern climes. It is generally given a hardiness rating of Zone 6. The fiddleheads of this fern are edible but care should be taken to not over-graze, as this could seriously detract from the appearance of this quite attractive plant.

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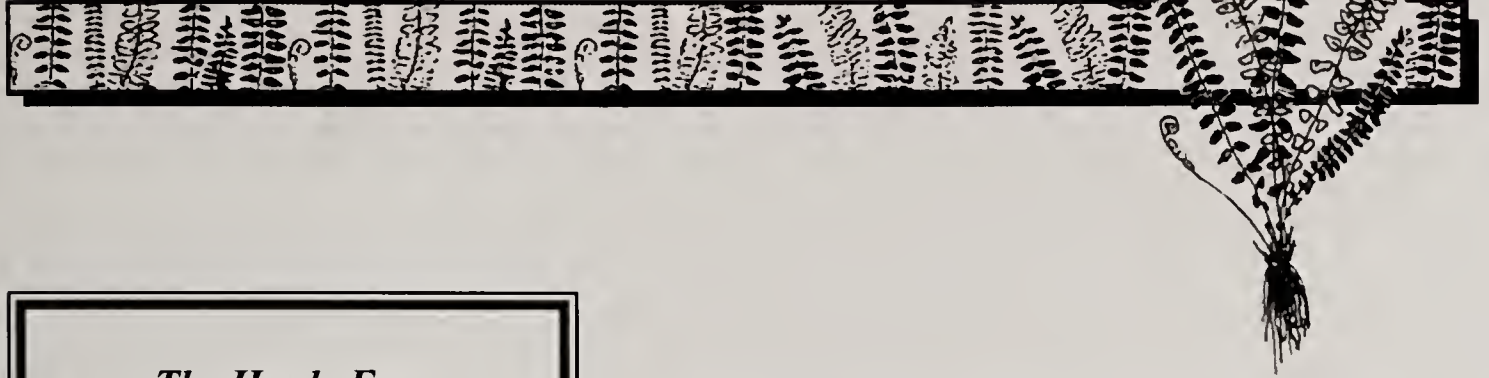
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